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Forest Insect and Disease Management

5230
BIOLOGICAL
EVALUATION R2-78-2

MOUNTAIN PINE BEETLE

Shoshone National Forest,
Bureau of Land Management,
State and Private Land
South Pass City
and Atlantic City,

Wyoming

July 1978

Rocky Mountain Region

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INTRODUCTION

The mountain pine beetle (MPB), *Dendroctonus ponderosae* Hopkins, continues to cause extensive mortality of lodgepole pine, *Pinus contorta* Douglas, and limber pine, *P. flexilis* James, on Federal, State and private lands near South Pass City and Atlantic City, Wyoming (Figure 1).

On June 21 and 22, 1978 Kent Eggleston, Mary Ann Gajewski and Deirdre Haneman, Biological Technicians, visited the area of infestation and conducted a brood sample survey of MPB infested pine. The purpose of the survey was to evaluate the overwintering population and predict the population trend for 1978. Utilizing Cole's sequential sampling procedure [1/], which is based on bark samples, the trend of the current population was determined at six locations.

TECHNICAL INFORMATION

CAUSAL AGENT: *Dendroctonus ponderosae* Hopkins, mountain pine beetle

HOST: *Pinus contorta* Douglas, lodgepole pine
Pinus flexilis James, limber pine

LIFE HISTORY: The mountain pine beetle has one generation per year. Adults attack trees from July through August by boring through the bark to the cambium. The females then tunnel upward for 12 inches to 30 inches (these tunnels are called egg galleries). The females lay eggs in individual niches along each side of the gallery which is then packed with frass. After hatching, the larvae feed in individual channels (larval galleries) at right angles to the egg gallery in the phloem. The insect overwinters in the larval stage. In the spring, when the larvae are fully developed, they excavate an oval chamber at the end of the larval gallery and pupate. Finally, mature adults emerge from the chamber by boring through the outer bark and fly to attack new trees, completing the generation.

1/ COLE, W. E. The mountain pine beetle in lodgepole pine. Progress report - Study I. USDA, For. Serv. Int. 4500-FS-INT-2201 25 pp. (for internal use only)

METHODS

Following Cole's sampling procedure, developing brood were counted from two 6-by-6-inch samples taken at dbh on opposite sides of infested lodgepole pine trees. Samples were taken at six sites: Little Popo Agie 1 & 2, Pass Creek, Rock Creek, Fossil Hill, and Sinks Canyon (Figure 2).

RESULTS AND CONCLUSIONS

At 5 of the 6 locations sampled, brood numbers indicated an increase in the popultaion (Table 1). The Sinks Canyon sample indicated a static population trend. Predators and parasites were not effective in controlling the beetle. Woodpecker activity was moderate to heavy. Some pines had been heavily woodpeckered from dbh and above, leaving little surviving brood. Continued losses of lodgepole pine to MPB may be expected again in 1978.

RECOMMENDATIONS

The general long-term protection measure to reduce beetle attacks within a given stand is to reduce average dbh of the stand below 8 inches. Present efforts on the existing timber sales should be continued. Adjacent timber sales should be set up and management plans made to enter uninfested areas, reducing the dbh of these areas before the infestation spreads to them. By reducing the average dbh of uninfested areas, the potential for epidemic losses will be reduced.

FIGURE 1

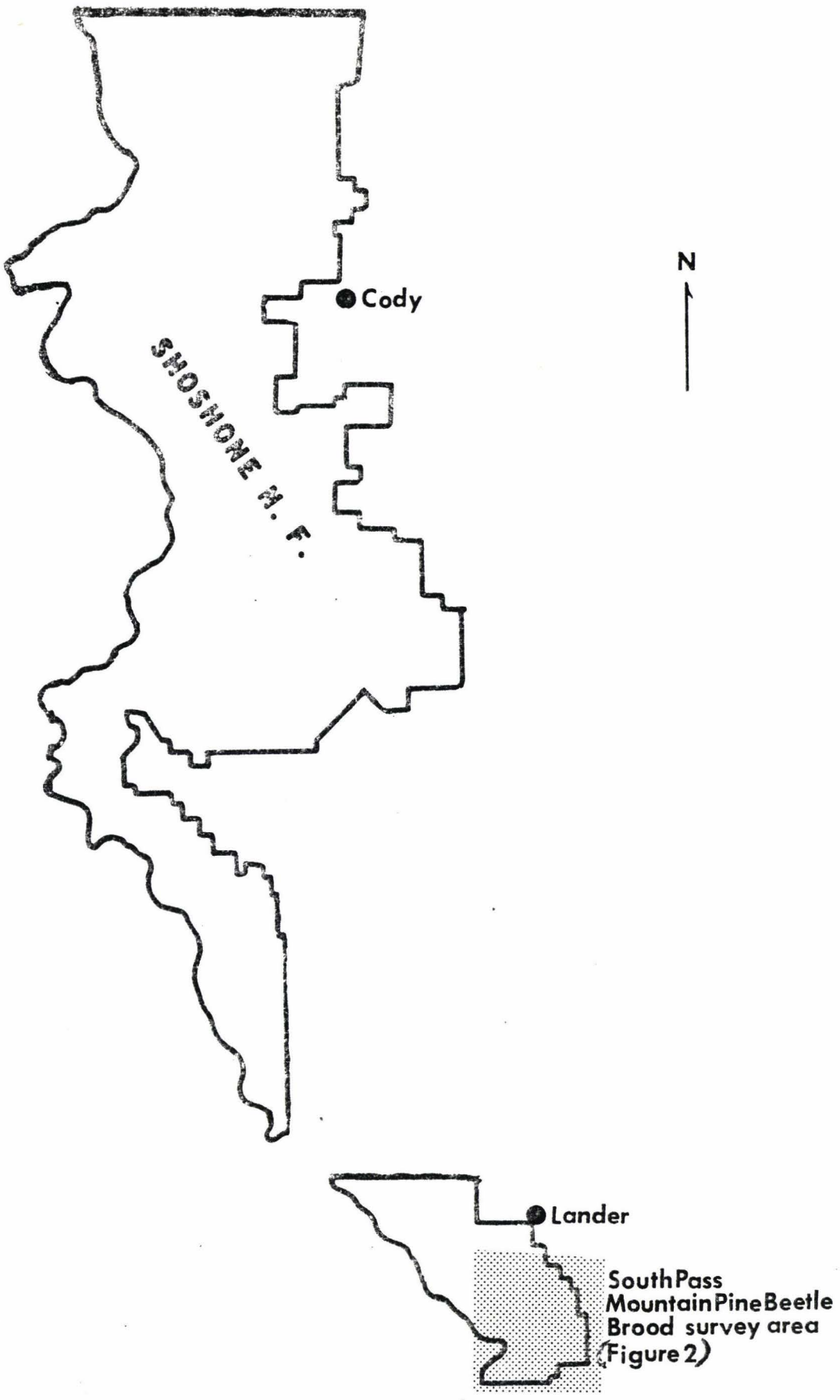
Cody
SHOSHONE N. F.
N
Lander
South Pass
Mountain Pine Beetle
Brood survey area
(Figure 2)

FIGURE 2
MOUNTAIN PINE BEETLE BROOD SURVEY
SHOSHONE NATIONAL FOREST - SOUTH
PASS - 1978

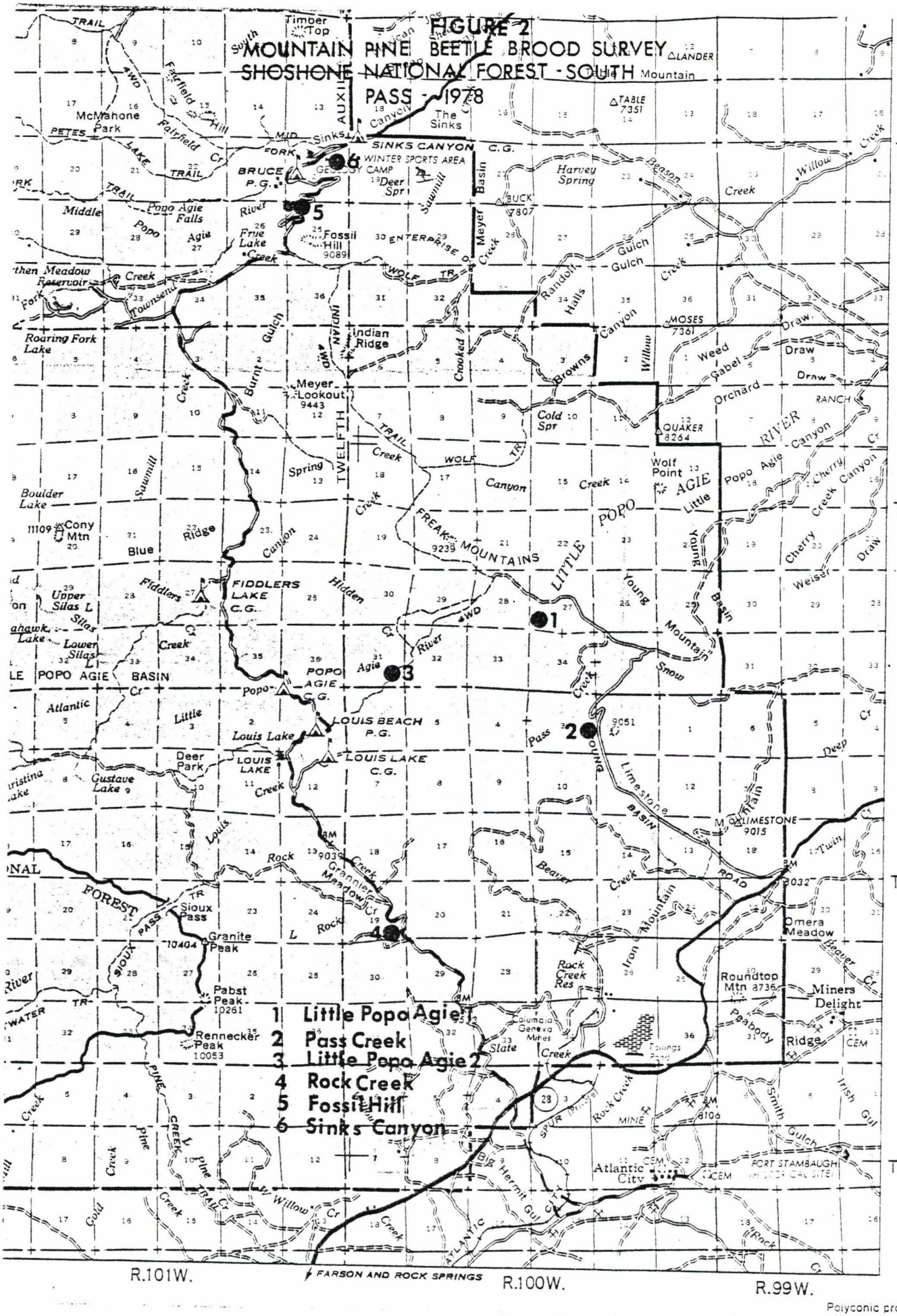

TABLE 1

Mountain Pine Beetle Brood Survey Summary
Shoshone National Forest - 1978

Area	Number of Trees	Average dbh	Number of Samples	Total Brood	Average Brood	Total Starts	Average Starts	Total Inches Egg Gallery	Average Inches Egg Gallery	Medetera	Basal Area	Wood-peckering[1/]	Elevation	Predicted Trend
Little Popo Agie (1)	3	10.53 ± .18	6	175	29.17 ± 5.27	8	1.33 ± .42	172	28.67		100	M - H	7,500	Increasing
Pass Creek	3	11.80 ± .83	6	51	8.50 ± 2.90	7	1.17 ± .31	147	24.50		150	M - H	8,500	Increasing
Little Popo Agie (2)	3	10.97 ± 1.23	6	113	18.83 ± 9.78	15	2.50 ± .56	242	40.33	5	110	M - H	8,400	Increasing
Rock Creek	3	14.37 ± 1.13	6	97	16.71 ± 7.48	12	2.00 ± .58	236	39.33		130	M - H	9,000	Increasing
Fossil Hill	2	14.55 ± 2.05	4	73	18.25 ± 8.45	9	2.25 ± .63	184	46.00		130	H	8,000	Increasing
Sinks Canyon	3	15.27 ± .99	6	15	2.50 ± 1.20	14	2.33 ± .33	209	34.83		50	M	7,100	Static
	17		34	524		65		1,190		5				
		12.83 ± .59			15.41 ± 2.94		1.91 ± .20		35.00		112	M - H	8,100	Increasing